

## CLAIMS

1. A method for calibrating a first molecular array scanner with a second, reference molecular array scanner, the method comprising:

initially calibrating the first molecular array scanner with the second, reference molecular array scanner using a same-dye reference array; and

maintaining the initial calibration using one or more stable-dye reference arrays.

2. The method of claim 1 wherein initially calibrating the first molecular array scanner with the second, reference molecular array scanner using a same-dye reference array further comprises:

scanning the same-dye reference array in the second, reference molecular array scanner to determine a measured signal intensity for the same-dye reference array in the reference molecular array scanner;

calculating an expected intensity for subsequently scanning the same-dye reference array in the second, reference molecular array scanner; and

scanning the same-dye reference array in the first scanner, and adjusting parameters in the first molecular array scanner to produce the expected intensity as if it were scanned in the reference scanner for the first time.

3. The method of claim 2 wherein calculating an expected intensity for scanning the same-dye reference array in the second, reference molecular array scanner a second time further comprises:

determining a function of signal intensity decrease per scan of the same-dye reference array; and

selecting the expected intensity corresponding to one more than a number of times that the same-dye reference array has been scanned.

4. The method of claim 1 wherein maintaining the initial calibration using one or more stable-dye reference arrays further includes:

following initial calibration, scanning a stable-dye reference array with the first molecular array scanner in order to determine a signal-intensity-to-stable-dye-concentration ratio; and

periodically rescanning the stable-dye reference array with the first molecular array scanner, adjusting the first molecular array scanner to provide the determined signal-intensity-to-stable-dye-concentration ratio.

5. Signal intensity data, scanned from the surface of a molecular array by a molecular array scanner calibrated to a reference molecular array by the method of claim 1, encoded by:

storing representations of the signal intensity data in a machine readable medium;

transmitting representations of the signal intensity data over an electronic communications medium;

displaying the signal intensity data on display device; and

printing representations of the signal intensity data in a human readable medium.

6. A system for calibrating a number of molecular array scanners to provide a fixed signal-intensity-to-label-concentration ratio, the system comprising:

a reference molecular array scanner;

a same-dye reference array used to establish an initial calibration of each of the number of molecular array scanners to the reference molecular array scanner; and

one or more stable-dye reference arrays used to maintain the initial calibration.

7. The system of claim 6 wherein the same-dye reference array is used to establish an initial calibration of each of the number of molecular array scanners to the reference molecular array scanner by:

scanning the same-dye reference array in the reference molecular array scanner to determine a measured signal intensity for the same-dye reference array in the reference molecular array scanner;

calculating an expected intensity for subsequently scanning the same-dye reference array in each of the number of molecular array scanners; and

adjusting each of the number of molecular array scanners to produce the respective calculated expected intensity for the molecular array scanner when subsequently scanning the same-dye reference array in the molecular array scanner.

8. The system of claim 7 wherein calculating the expected intensity for subsequently scanning the same-dye reference array in each of the number of molecular array scanners further comprises:

determining a function of signal intensity decrease per scan of the same-dye reference array; and

selecting the expected intensity for one of the number of molecular array scanners corresponding to one more than a number of times that the same-dye reference array has been scanned.

9. The system of claim 6 wherein one or more stable-dye reference arrays are used to maintain the initial calibration of one of the number of molecular array scanners by:

scanning a stable-dye reference array with the molecular array scanner in order to determine a signal-intensity-to-stable-dye-concentration ratio; and

periodically rescanning the stable-dye reference array with the molecular array scanner, adjusting the molecular array scanner to provide the determined signal-intensity-to-stable-dye-concentration ratio.

10. Signal intensity data, scanned from the surface of a molecular array by a molecular array scanner calibrated to a reference molecular array by the system of claim 1, encoded by:

storing representations of the signal intensity data in a machine readable medium;

transmitting representations of the signal intensity data over an electronic communications medium;  
displaying the signal intensity data on display device; and  
printing representations of the signal intensity data in a human readable medium.

2025 RELEASE UNDER E.O. 14176